**1.000 - 172.93m**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.02 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |

**2.000 - 60.01m**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.005 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |

**1.000 - 22.04m**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.003 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |

**1.001 - 16.32m**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.002 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |

**1.003 - 20.96m**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.002 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |

**Green Roof 1**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.009 |

## Dynamic Sizing

| Runoff Method | Green Roof |
|---|---|
| Summer Volumetric Runoff Coefficient | 0.750 |
| Winter Volumetric Runoff Coefficient | 0.840 |
| Depression Storage (mm) | 40 |
| Evapotranspiration (mm/day) | 3.0 |
| Decay Coefficiency | 0.050 |
| Time Delay (mins) | 120 |
| Urban Creep (%) | 0 |

**Green Roof 2**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.008 |

## Dynamic Sizing

| Runoff Method | Green Roof |
|---|---|
| Summer Volumetric Runoff Coefficient | 0.750 |
| Winter Volumetric Runoff Coefficient | 0.840 |
| Depression Storage (mm) | 40 |
| Evapotranspiration (mm/day) | 3.0 |
| Decay Coefficiency | 0.050 |
| Time Delay (mins) | 120 |
| Urban Creep (%) | 0 |

**Green Roof 3**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.008 |

## Dynamic Sizing

| | |
|---|---|
| Runoff Method | Green Roof |
| Summer Volumetric Runoff Coefficient | 0.750 |
| Winter Volumetric Runoff Coefficient | 0.840 |
| Depression Storage (mm) | 40 |
| Evapotranspiration (mm/day) | 3.0 |
| Decay Coefficiency | 0.050 |
| Time Delay (mins) | 120 |
| Urban Creep (%) | 0 |

**Green Roof 4&5**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.003 |

## Dynamic Sizing

| | |
|---|---|
| Runoff Method | Green Roof |
| Summer Volumetric Runoff Coefficient | 0.750 |
| Winter Volumetric Runoff Coefficient | 0.840 |
| Depression Storage (mm) | 40 |
| Evapotranspiration (mm/day) | 3.0 |
| Decay Coefficiency | 0.050 |
| Time Delay (mins) | 120 |
| Urban Creep (%) | 0 |

**Catchment Area**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.002 |

## Dynamic Sizing

| | |
|---|---|
| Runoff Method | Time of Concentration |
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |

| Project: | Date: | | |
|---|---|---|---|
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| Report Details:<br>Type: Inflows<br>Storm Phase: Surface Network 1 | MHA STRUCTURAL DESIGN:<br>London: +44 (0)207 375 6340<br>Cambridge: +44 (0)1223 776340<br>mhastructuraldesign.com | | |

**Catchment Area (1)**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.003 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |

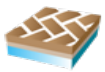
**Catchment Area (Porous)**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.005 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |
| Urban Creep (%) | 0 |



**Porous Paving**

Type : Porous Paving

## Dimensions

| | |
|---|---|
| Exceedance Level (m) | 0.000 |
| Depth (m) | 0.200 |
| Base Level (m) | -0.200 |
| Paving Layer Depth (mm) | 60 |
| Membrane Percolation (m/hr) | 3.0 |
| Porosity (%) | 30 |
| Length (m) | 11.512 |
| Long. Slope (1:X) | 350.00 |
| Width (m) | 3.839 |
| Total Volume (m³) | 1.856 |

## Inlets

### Inlet

| | |
|---|---|
| Inlet Type | Point Inflow |
| Incoming Item(s) | Green Roof 4&5<br>Catchment Area (Porous) |
| Bypass Destination | (None) |
| Capacity Type | No Restriction |

## Outlets

### Outlet

| | |
|---|---|
| Outgoing Connection | Pipe |
| Outlet Type | Free Discharge |

## Advanced

| | |
|---|---|
| Base Infiltration Rate (m/hr) | 0.0 |
| Side Infiltration Rate (m/hr) | 0.0 |
| Safety Factor | 2.0 |
| Conductivity (m/hr) | 500.0 |

| Project: | Date: | | |
|---|---|---|---|
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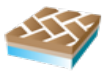

**Porous Paving (1)**

Type : Porous Paving

## Dimensions

| | |
|---|---|
| Exceedance Level (m) | 0.000 |
| Depth (m) | 0.200 |
| Base Level (m) | -0.200 |
| Paving Layer Depth (mm) | 60 |
| Membrane Percolation (m/hr) | 3.0 |
| Porosity (%) | 30 |
| Length (m) | 38.750 |
| Long. Slope (1:X) | 500.00 |
| Width (m) | 1.972 |
| Total Volume (m³) | 3.210 |

## Inlets

### Inlet

| | |
|---|---|
| Inlet Type | Point Inflow |
| Incoming Item(s) | Catchment Area (1) |
| Bypass Destination | (None) |
| Capacity Type | No Restriction |

## Outlets

## Advanced

| | |
|---|---|
| Conductivity (m/hr) | 500.0 |

| Project: | Date: | | |
|---|---|---|---|
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| Inflow Label | Connected To | Flow (L/s) | Runoff Method | Area (ha) | Percentage Impervious (%) | Urban Creep (%) | Adjusted Percentage Impervious (%) | Area Analysed (ha) |
|---|---|---|---|---|---|---|---|---|
| 1.000 - 22.04m | MH1 | | Time of Concentration | 0.003 | 100 | 0 | 100 | 0.003 |
| 1.000 - 172.93m | MH1 | | Time of Concentration | 0.020 | 100 | 0 | 100 | 0.020 |
| 1.001 - 16.32m | MH2 | | Time of Concentration | 0.002 | 100 | 0 | 100 | 0.002 |
| 1.003 - 20.96m | MH3 | | Time of Concentration | 0.002 | 100 | 0 | 100 | 0.002 |
| 2.000 - 60.01m | S1 | | Time of Concentration | 0.005 | 100 | 0 | 100 | 0.005 |
| Catchment Area | MH | | Time of Concentration | 0.002 | 100 | 0 | 100 | 0.002 |
| Catchment Area (1) | Porous Paving (1) | | Time of Concentration | 0.003 | 100 | 0 | 100 | 0.003 |
| Catchment Area (Porous) | Porous Paving | | Time of Concentration | 0.005 | 100 | 0 | 100 | 0.005 |
| Green Roof 1 | MH1 | | Green Roof | 0.009 | | 0 | | 0.009 |
| Green Roof 2 | MH | | Green Roof | 0.008 | | 0 | | 0.008 |
| Green Roof 3 | MH2 | | Green Roof | 0.008 | | 0 | | 0.008 |
| Green Roof 4&5 | Porous Paving | | Green Roof | 0.003 | | 0 | | 0.003 |
| **TOTAL** | | **0.0** | | **0.071** | | | | **0.071** |

| Project: | Date: | | |
|---|---|---|---|
| 81 BELSIZE PARK GARDENS<br>Project No:<br>22064 | 31/07/2023 | | |
| | Designed by:<br>FJ | Checked by: | Approved By: |
| Report Title:<br>Rainfall Analysis Criteria | MHA STRUCTURAL DESIGN:<br>London: +44 (0)207 375 6340<br>Cambridge: +44 (0)1223 776340<br>mhastructuraldesign.com | | |

| | |
|---|---|
| Runoff Type | Dynamic |
| Output Interval (mins) | 5 |
| Time Step | Default |
| Urban Creep | Use Catchment Values |
| Junction Flood Risk Margin (mm) | 0 |
| Perform No Discharge Analysis | ☐ |

## Rainfall

### FSR

Type: FSR

| | |
|---|---|
| Region | England And Wales |
| M5-60 (mm) | 20.0 |
| Ratio R | 0.400 |
| Summer | ☑ |
| Winter | ☑ |

### Return Period

| Return Period (years) | Increase Rainfall (%) |
|---|---|
| 1.0 | 0.000 |
| 30.0 | 35.000 |
| 100.0 | 40.000 |

### Storm Durations

| Duration (mins) | Run Time (mins) |
|---|---|
| 15 | 30 |
| 30 | 60 |
| 60 | 120 |
| 120 | 240 |
| 240 | 480 |
| 360 | 720 |
| 480 | 960 |
| 960 | 1920 |
| 1440 | 2880 |

| Project: | Date: | | |
|---|---|---|---|
| 81 BELSIZE PARK GARDENS<br>Project No:<br>22064 | 31/07/2023 | | |
| | Designed by:<br>FJ | Checked by: | Approved By: |
| Report Title:<br>UK and Ireland Rural Runoff Calculator | MHA STRUCTURAL DESIGN:<br>London: +44 (0)207 375 6340<br>Cambridge: +44 (0)1223 776340<br>mhastructuraldesign.com | | |

# Greenfield Volume

## FSR

### Details

| Region | England And Wales |
|---|---|
| M5-60 (mm) | 20.0 |
| Ratio R | 0.4 |
| Area (ha) | 0.072 |
| SAAR (mm) | 638.0 |
| CWI | 93.840 |
| Urban User | 0 |
| Areal Reduction Factor | 1.00 |
| SPR | 30 |
| Storm Duration (mins) | 360 |
| Return Period (years) | 100 |

### Results

| | |
|---|---|
| PR% | 26.19 |
| Greenfield Runoff Volume ($m^3$) | 11.787 |

| Project: | Date: | | |
|---|---|---|---|
| 81 BELSIZE PARK GARDENS<br>Project No:<br>22064 | 31/07/2023<br>Designed by:<br>FJ | Checked by: | Approved By: |
| Report Details:<br>Type: Junctions Summary<br>Storm Phase: Surface Network 1 | MHA STRUCTURAL DESIGN:<br>London: +44 (0)207 375 6340<br>Cambridge: +44 (0)1223 776340<br>mhastructuraldesign.com | | |

**FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth**

| Junction | Storm Event | Cover Level (m) | Invert Level (m) | Max. Level (m) | Max. Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MH1 | FSR: 1 years: +0 %: 15 mins: Winter | 0.000 | -0.530 | -0.487 | 0.043 | 3.3 | 0.027 | 0.000 | 3.3 | 1.539 | OK |
| MH | FSR: 1 years: +0 %: 15 mins: Winter | 0.000 | -0.750 | -0.713 | 0.037 | 3.5 | 0.024 | 0.000 | 3.4 | 1.639 | OK |
| MH2 | FSR: 1 years: +0 %: 15 mins: Winter | 0.000 | -1.230 | -1.181 | 0.049 | 3.7 | 0.031 | 0.000 | 3.6 | 1.792 | OK |
| MH4 | FSR: 1 years: +0 %: 15 mins: Winter | 0.000 | -1.750 | -1.703 | 0.047 | 4.4 | 0.053 | 0.000 | 4.3 | 2.214 | OK |
| S1 | FSR: 1 years: +0 %: 15 mins: Winter | 0.000 | -0.900 | -0.891 | 0.009 | 0.7 | 0.001 | 0.000 | 0.6 | 0.306 | OK |
| Outfall | FSR: 1 years: +0 %: 15 mins: Winter | 0.000 | -1.900 | -1.857 | 0.043 | 4.3 | 0.000 | 0.000 | 4.3 | 2.214 | OK |
| MH3 | FSR: 1 years: +0 %: 15 mins: Winter | 0.000 | -1.310 | -1.272 | 0.038 | 3.9 | 0.024 | 0.000 | 3.8 | 1.912 | OK |

| Project: | Date: | | |
|---|---|---|---|
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| Report Details:<br>Type: Junctions Summary<br>Storm Phase: Surface Network 1 | MHA STRUCTURAL DESIGN:<br>London: +44 (0)207 375 6340<br>Cambridge: +44 (0)1223 776340<br>mhastructuraldesign.com | | |

**FSR: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Depth**

| Junction | Storm Event | Cover Level (m) | Invert Level (m) | Max. Level (m) | Max. Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MH1 | FSR: 30 years: +35 %: 15 mins: Winter | 0.000 | -0.530 | -0.397 | 0.133 | 11.0 | 0.085 | 0.000 | 9.4 | 5.103 | Surcharged |
| MH | FSR: 30 years: +35 %: 15 mins: Winter | 0.000 | -0.750 | -0.675 | 0.075 | 10.1 | 0.047 | 0.000 | 10.1 | 5.440 | OK |
| MH2 | FSR: 30 years: +35 %: 15 mins: Winter | 0.000 | -1.230 | -1.047 | 0.183 | 11.3 | 0.116 | 0.000 | 10.8 | 5.967 | Surcharged |
| MH4 | FSR: 30 years: +35 %: 15 mins: Winter | 0.000 | -1.750 | -1.573 | 0.177 | 12.9 | 0.200 | 0.000 | 12.0 | 7.475 | Surcharged |
| S1 | FSR: 30 years: +35 %: 15 mins: Winter | 0.000 | -0.900 | -0.885 | 0.015 | 2.2 | 0.002 | 0.000 | 2.2 | 1.105 | OK |
| Outfall | FSR: 30 years: +35 %: 15 mins: Summer | 0.000 | -1.900 | -1.800 | 0.100 | 11.3 | 0.000 | 0.000 | 11.5 | 6.648 | OK |
| MH3 | FSR: 30 years: +35 %: 15 mins: Winter | 0.000 | -1.310 | -1.226 | 0.084 | 11.7 | 0.053 | 0.000 | 10.8 | 6.379 | OK |

| Project: | Date: | | |
|---|---|---|---|
| 81 BELSIZE PARK GARDENS<br>Project No:<br>22064 | 31/07/2023<br>Designed by:<br>FJ | Checked by: | Approved By: |
| Report Details:<br>Type: Junctions Summary<br>Storm Phase: Surface Network 1 | MHA STRUCTURAL DESIGN:<br>London: +44 (0)207 375 6340<br>Cambridge: +44 (0)1223 776340<br>mhastructuraldesign.com | | |

**FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth**

| Junction | Storm Event | Cover Level (m) | Invert Level (m) | Max. Level (m) | Max. Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MH1 | FSR: 100 years: +40 %: 15 mins: Winter | 0.000 | -0.530 | -0.197 | 0.333 | 14.8 | 0.212 | 0.000 | 11.5 | 6.864 | Surcharged |
| MH | FSR: 100 years: +40 %: 15 mins: Winter | 0.000 | -0.750 | -0.533 | 0.217 | 12.5 | 0.138 | 0.000 | 10.4 | 7.312 | Surcharged |
| MH2 | FSR: 100 years: +40 %: 15 mins: Winter | 0.000 | -1.230 | -0.888 | 0.342 | 11.9 | 0.218 | 0.000 | 11.0 | 8.015 | Surcharged |
| MH4 | FSR: 100 years: +40 %: 15 mins: Winter | 0.000 | -1.750 | -1.514 | 0.236 | 13.8 | 0.267 | 0.000 | 13.4 | 10.184 | Surcharged |
| S1 | FSR: 100 years: +40 %: 15 mins: Winter | 0.000 | -0.900 | -0.883 | 0.017 | 3.0 | 0.003 | 0.000 | 2.9 | 1.623 | OK |
| Outfall | FSR: 100 years: +40 %: 15 mins: Summer | 0.000 | -1.900 | -1.800 | 0.100 | 12.9 | 0.000 | 0.000 | 12.9 | 9.040 | OK |
| MH3 | FSR: 100 years: +40 %: 15 mins: Winter | 0.000 | -1.310 | -1.052 | 0.258 | 11.9 | 0.164 | 0.000 | 12.0 | 8.572 | Surcharged |